# Science Discovers the Physiological Value of Continence – Part 2

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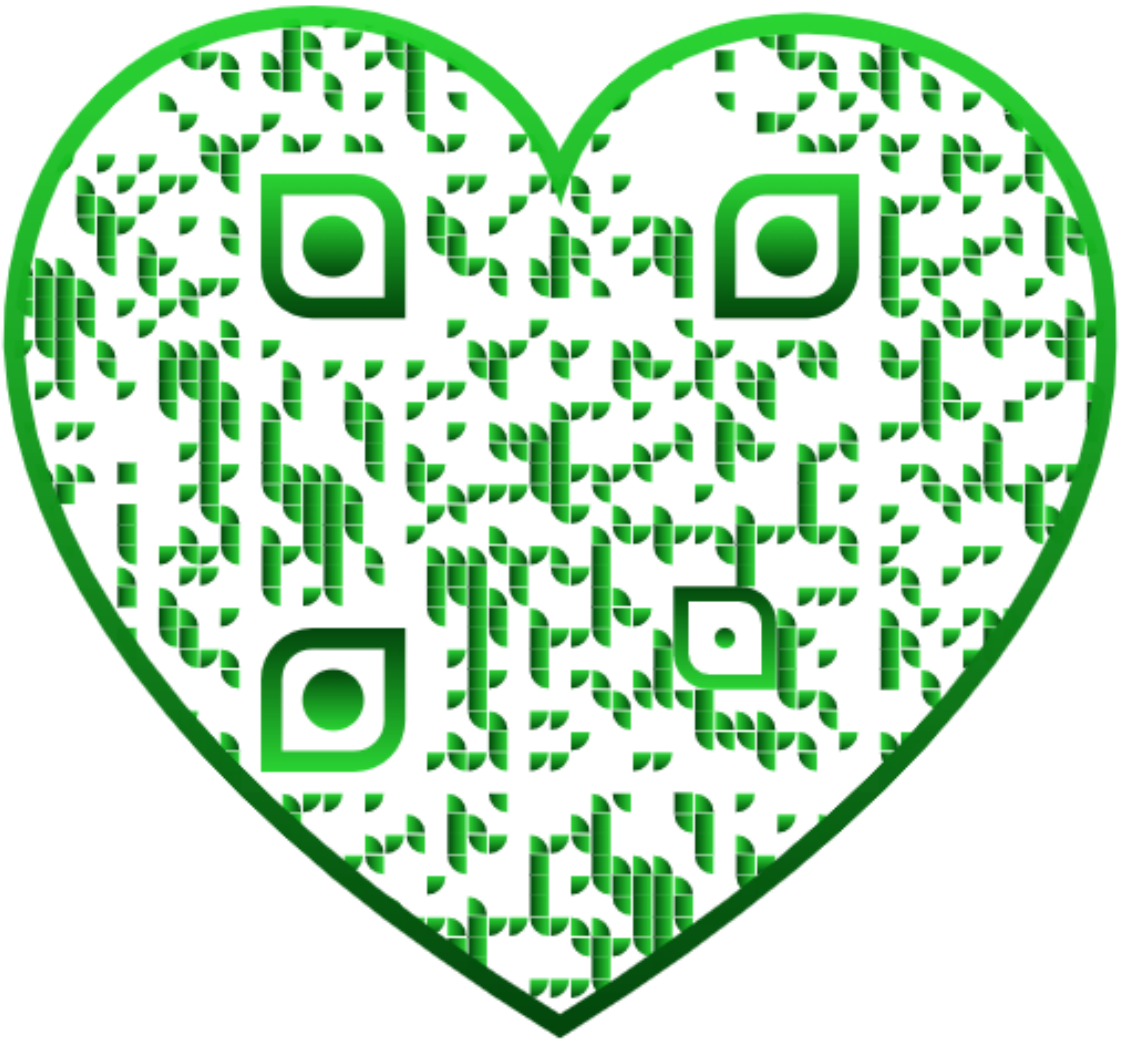
(continued) Professor Casper, of the University of Berlin, regards spermatorrhea and neurasthenia as going hand in hand, and that both result from excessive seminal losses through sexual excess, leading to involuntary emissions. In his "Textbook of Genito- Urinary diseases, speaking of spermatorrhea, he says: "Sexual excesses may cause the symptom, either directly or by causing neurasthenia. Of the sexual excesses, masturbation occupies first place. It must be conceded that if the habit is persisted in for years it will impair the soundness of both body and mind, that it will result in enfeeblement and hyperesthenia of the nervous system... Frequent pollutions may occur in certain organic diseases of the spinal cord, in the early stages of tabes and myelitis, for instance." Among the causes of nervous diseases Casper refers to coitus interruptus as a prominent one.

Modern studies of the etiology of neurasthenia trace this disorder to a disturbance in the functioning of the endocrine glands, which glandular dysfunction has a sexual causation. According to Dr. Harrower, "The more we study the neurasthenic individual and closely observe the incidental variations in functional activity, the more evident it becomes that neurasthenia rarely exists without some associated disturbance in the work of the ductless glands."

The fluids elaborated by the testes, the prostate gland and the accessory sex glands are very rich in phosphorus, as are the spermatozoa themselves. The loss of semen must therefore lower the phosphorus content of the blood, for it is from here that these glands derive the phosphorus for the manufacture of their secretions. This must deprive the nervous system of an element so necessary for its nutrition and normal well-being. This explains the neurasthenic effects of masturbation and sexual excess, which are due to loss of phosphorus through seminal emissions. The same occurs in prostatitis, where considerable phosphorus is lost through the expelled prostatic fluid. Lorand points out the beneficial influence of phosphorus when administered in many brain disorders, which are accompanied by a diminution of the phosphorus content of the brain, as Marie found in idiocy and dementia praecox. In the brain phosphorus is present chiefly in the form of lecithin, a phosphorized fat.

Dr. Evans, an English physiologist, has presented the interesting idea that thinking is merely a phase of phosphorus metabolism in the brain, which recalls the saying of German biochemists, "Ohne Phosphor keine Gedanken" (Without phosphorus, no thought). Evans states that during thinking and mental exertion, phosphates are increased in the excreta; and he therefore concludes that thinking involves an oxidation of phosphorus compounds in the brain (under the catalytic influence of the iodine of the thyroid hormone). Evans says: "If we take a fresh brain (either



human or animal), and immerse it in either absolute alcohol, sulphuric ether or olive oil, we obtain a luminous solution of phosphorus." This may be the origin of the phosphorescent "brain glow" observed by Dr. G.W. Crile as given off by the living brain in a dark room. In this oxidation of phosphorus in the brain, Evans sees the origin of the generation of electric nerve-currents (for the oxidation of phosphorus in the atmosphere causes an electric discharge to be given off. Crile has shown that the electrical energy of the nervous system is generated in the brain, which represents a central storage battery of the body.)

It is thus clear that phosphorus, oxygen and sufficient thyroid hormone (iodine) are all necessary for the normal generation of brain electricity, and that in the absence of either of these three elements, there will be deficient brain action. For it is well known that the brain is richer in phosphorus than any other part of the body, and also uses up oxygen three times as rapidly as other tissues; also without the catalytic influence of the thyroid hormone, it cannot function normally -- or without iodine on which element the thyroid depends for the manufacture of its secretion.

According to this point of view, neurasthenia may be considered as representing a condition of phosphorus deficiency, or rather lecithin deficiency -- for lecithin is the form in which phosphorus is present in the myelin sheaths of the nerves, the nerve-oil whose burning keeps the fires of nerve vitality burning. Since lecithin is a prominent constituent of the semen, we can understand why excessive loss of semen can cause nerve starvation and all the symptoms of neurasthenia. When the lack of lecithin and organic phosphorus is more serious, the brain itself suffers lecithin deficiency and becomes disturbed in its functioning, just as any other starved organ is when deprived of the elements it requires for its normal nutrition and functioning. In this way, psychoses commence to manifest. From beri beri to polyneuritis, to psychoses, is only a transition or more graver nerve-and-brain-cell starvation of the vitamin B complex and lecithin, both of which are intimately related and to a large extent replaceable. (Foods rich in vitamin B complex, like the germ of grains, legumes, Brewer's yeast, etc., are generally also rich sources of lecithin.)

That a basic cause of nervous and mental disorders is a lecithin deficiency in the organism, produced by excessive withdrawals of this substance to replace expended secretions (the semen, like nerve and brain cells, being very rich in lecithin) is probable. The action of alcohol, like that of anesthetics, is dependent on its activity to dissolve and remove lecithin from the brain; and when the concentration of brain lecithin is sufficiently lowered, insanity is the result. Sexual excess produces a similar effect; and, together with alcohol, constitutes a principal cause of neuropsychopathic conditions.

The modern view is that the origin of nervous and mental disorders is to be looked for in the endocrine glands. Now it is interesting to note that organic phosphorus, in the form of lecithin, is not only a prominent constituent of nerve and brain tissue but also of the endocrine glands, and is as necessary to the nutrition of the latter as it is of the former. Fenger, in an article, "Phosphatides in the Ductless Glands," points out that all the ductless gland, like nervous tissue, are rich in lecithin (phosphatides, phospholipins). An ether-extract of the pituitary gland was found to contain 62.61% lecithin. The anterior portion of the gland was found to contain ten times as much phosphatides (lecithin) as lean meat; the posterior pituitary, seven times this

amount, being similar in composition to the brain. The pineal gland was found to contain thirteen times as much lecithin as lean meat. Jeleffy showed, the pineal gland is filled with neuroglia and rich in phosphorus; these neuroglia are believed to possess photo-sensibility to ultra-violet rays. The corpus luteum of the ovary was found by Fenger to contain 15 times as much phosphatides as lean meat, and the suprarenal gland was found to contain the most of all, seventeen times as much as lean meat.

In view of these observations, we can understand the reason why Dr. Brinkley places the sex glands in the position of master glands in the endocrine chain, for they alone, through their external secretion, are able to withdraw considerable amounts of lecithin and phosphatides from the circulation, and thus directly affect the functioning of the other glands, which are so dependent on phosphatides for their normal functioning. The immediate effect of such sudden lowering of the phosphatide content of the blood, as the result of seminal emissions, is to produce hyperactivity of other endocrines. This explains the observed swelling of the thyroid gland during menstruation, and as the result of coitus, which is noticeable in women, in whom this gland enlarges and over-secretes at this time. For this reason hyperthyroidism and goiter have a relation to sexual excess. Enlargement of the thyroid gland in the bride the morning after the wedding has traditionally been taken as a sign that intercourse has taken place. But while the immediate effect of such phosphatide withdrawal is overactivity of the other endocrines, as a compensatory factor in the body's effort to maintain a normal concentration of phosphatides in the blood, the final effect is to produce underactivity and atrophy of the endocrines, due to chronic phosphatide deficiency; and this is why sexual excess leads to an earlier appearance of senility, a condition resulting from endocrine hypofunction and degeneration. Thus the basic cause of endocrine dysfunctions--hypoactivity or hyperactivity--is to be found in the sex glands and their ability to alter the lecithin or phosphatide content of the blood, which is the primary raw material from which the endocrines manufacture their hormones.

There is no time in life when the endocrine glands of the individual may be more powerfully affected by a deficiency of phosphatides than during the months of embryonic development, when these glands are most sensitive to their chemical environment, the maternal blood-stream. Deficiency of phosphatides in the mother's blood at this time, due to ovarian overactivity (as the result of sexual intercourse) may affect the development of the thyroid and other endocrine glands of the embryo, as well as of its central nervous system. This explains the origin of cretins and Mongolian idiots, when born of parents with normal heredity. Prof. M. Schlapp, neuropsychiatrist of the New York Post-Graduate Hospital, has made a special study of this problem, studying hundreds of cases of cretins born of normal parents, and his conclusion is that a prenatal injury to the thyroid and other glands of the embryo by an endocrine disturbance in the mother was the basic cause of such conditions. He noted a preponderance of such children born from adolescent mothers or those approaching the climateric, when the ovaries tend to be most active. Dr. Schlapp believes that glandular depletion of the mother during gestation is the basic cause of the production of cretins and idiots, when there is no direct hereditary causation. It is clear that such "glandular depletion" can result from the excessive withdrawal of phosphatides from the mother's blood as the result of sexual intercourse during pregnancy, which also tends to produce endocrine dysfunction in the form of glandular hyper-and-hypoactivities.

The phosphatide withdrawal caused by activity of the sex glands and seminal emission exercises a most powerful effect upon the thymus glands, which are most dependent on adequate phosphorus supply for their normal well-being and activity. Now it is interesting to note that coincident with the increased activity of the sex glands at puberty and the subsequent withdrawal by them of phosphatides, the thymus gland degenerates. Such degeneration may be viewed as a product of lecithin deficiency, similar to the endocrine degeneration which McCarrison notes to result from vitamin B deficiency. If lack of vitamin B causes the thymus to degenerate, lack of lecithin, which is similar in its action, should do the same. Experiments on animals have shown that the thymus is more easily affected than other glands by deficiency of phosphorus and vitamins in the diet, and atrophies then deprived of these elements. The lymphoid cells of the thymus, according Chittenden, contain 3.5% of a nucleo-protein rich in phosphorus.

According to Hammar, the thymus increases in weight from 5 grams at birth to 25 grams at puberty, after which it commences to diminish, losing 5 grams between the ages of 15 and 25. However there are individuals in whom this thymus degeneration does not occur and in whom the thymus persist throughout life. According to Berman, Raphael, noted for his chastity, was such a thymocentric individual in whom thymus degeneration did not occur. It is probable that phosphatide starvation as the result of the seminal emissions of puberty cause the customary degeneration of the thymus at this time. This results from a disturbance of phosphorus metabolism, which leads to a similar disturbance of calcium metabolism. Basch found considerable excretion of calcium in thymectomized animals, which leads to ricket-like symptoms.

The parenchyma of the thymus contains nucleinates rich in phosphorus. Nucleohiston, the most important protein of the thymus, contains 3.7% phosphorus. The richness of the thymus in phosphorus shows that it is important not only for the proper development of the bones, but also the brain, for which reason premature atrophy of the thymus leads to the appearance of idiocy. At the Bicetre Hospital, according to Morel, 75 per cent of non-myxedematous idiotic children, from one to five years old, showed absence of the thymus gland on post-mortem examination. Bourneville also found absence of the thymus in 28 feeble-minded children examined. Basch, Kloss, Vogt, Morel and others observed mental disorders in puppies the fifth or sixth month after removal of the thymus. The animals appeared idiotic and retarded in development. Both bone and brain deformities appeared as the result of the phosphorus deficiency thus produced.

That the internal secretion of the sex glands may have a nutritive function in relation to nervous tissue and brain cells, and that mental diseases may result from its absence, is indicated by the observation of McCarrison, who found that atrophy of the testicles is frequently found in cerebral and spinal diseases. Thorek, in his work on the testis, notes developmental defects in the reproductive system of idiots and cretins. Todde found diminished weight of the testicle in 88% of 25 cases of dementia praecox studied. Many physicians also noted an improvement in dementia praecox after gland transplantation. Frequently, in operating upon women having dementia praecox and other psychoses, atrophied ovaries are found. Neurotic phenomena usually follow the removal of the ovaries. Matsumotot, in study of 20 cases of dementia praecox, found cessation of spermatogenesis.

These facts indicate an intimate relation between spermatozoa and the cells of the cerebral cortex, absence of the formation of the former leading to decline of the latter. There is evidence that spermatozoa, when not discharged, are resorbed into the blood-stream and carried to the brain. Both in their chemical composition and their elongated form, they have a remarkable similarity to brain-cells, which, like them, lack the capacity of reproduction, in contrast to most other cells of the body which have this capacity. Could spermatozoa, passing to the brain and spinal marrow, have a relation to the mobile neuroglia, which likewise move about by flagellated motions of their tail, and which are potential cells of the central nervous system? This is an interesting speculation. Norret must have had some such thought in mind when he remarked, "The resorption of what Dr.LeCamus called a mass of microscopic brains is a source of vigor and longevity."

That the semen contains substances of great physiological value, especially in relation to the nutrition of the nervous system, is clear from its chemical analysis, which shows that it is extremely rich in lecithin, cholesterin and phosphorus, the chief constituents of nerve and brain tissue. It therefore follows that the withdrawal of these substances from the circulation by seminal discharges (voluntarily or involuntarily) must have an adverse effect on the nutrition of nerve and brain tissue and result in disturbed functioning. Such biochemical consideration support the view that loss of seminal fluid involves lowered nutrition of nerve and brain tissue, and, when excessive, to nervous and mental disorders. The remarkable similarity in chemical composition between the semen and the central nervous system indicates such a relationship. Older physiologists suspected this fact. Hoffman wrote:

"One easily understands why there is so intimate a connection between the brain and the testicles, since these two organs separate from the blood the most exquisite part of the lymph... The seminal fluid is distributed in all the nerves of the body; it seems to be of the same nature." (Could this "most exquisite" part of the lymph which both the testicles and the brain extract from the blood be lecithin?)

That the semen contains substances of great importance for the nutrition of the central nervous system was clearly shown by the isolation from the semen of Spermine, the active principle of testicular extracts, by Poehl, a Russian physiologist. Poehl found that when Spermine was injected into animals it acted as a catalyst of cell activity, resulting in an increased rate of oxidation in all tissues, metabolic processes being accelerated and nervous citality increased. The effects were similar to those observed by Brown-Sequard after spermatic injections. Since Schreiner, the discoverer of spermin, had shown in 1878 that it is a normal constituent of the semen, this indicates that the latter acts as a nerve stimulant in the organism in which it is formed and resorbed, and that its loss must deprive the nervous system and brain of its stimulating action. It may be for this reason that natives in some parts of Australia, according to Havelock Ellis, administer a potion of semen to feeble and dying members of their tribe.

Both the semen and the brain are composed largely of phosphorized fats, or phospholipins, to which class lecithin belongs. Lecithin is a substance of great importance for the nervous tissue. It is claimed by some that the nerve fatigue experienced at the end of the day's activities is due to an exhaustion of the daily supply of lecithin in the myelin sheaths of the nerves, and that the invigorating effect of sleep is due to this lecithin being replenished during the night. The chronic

fatigue of old age is considered to be due to a lecithin deficiency of the endocrine glands and the body as a whole. Lecithin is essential to the life of the nervous system, the brain and the endocrine glands. Alderhalden, in his "Physiological Chemistry", describes the distribution of lecithin as follows: "It occurs principally in animal tissues, in the brain, nerves, fish-eggs, yolk of eggs and in the spermatozoa." According to Prof. Sajous, lecithin is "a conspicuous component of the brain, nerves, yolk of egg and the semen."

Now since both the brain and the semen depend for their supply of lecithin on what exists in the blood, it is clear that excessive withdrawal of lecithin by the sex glands would mean that a smaller amount would be available for the nutrition of nerve and brain tissue. May not neuroses and psychoses be due to such diminished nutrition of nerve and brain cells due to such diminished nutrition of nerve and brain cells due to excessive withdrawal of lecithin and cholesterol from the blood to replace expended seminal secretions? The tonic effect of lecithin preparations upon the nervous system would indicate that the conservation of the body's own lecithin should constitute a therapeutic measure of primary importance in the treatment of neurasthenia and mental disorders.

Lecithin is readily combustible, and containing a large amount of stored potential energy, it is well adapted to sustaining the ceaseless activities of the brain and nervous system, as well as the respiratory organs, through its oxidation, which releases nerve electricity. As oil burns in the fine ramifications of a wick so does lecithin burn in the fine ramifications of the nerve fibers.

The only other part of the body that can compare with brain, nerve and endocrine tissue in high content of lecithin is the semen and spermatozoa, for like the brain, the semen is a fatty substance rich in phosphorized fats, the phosphatides or phospholipins. That considerable lecithin is required for the forming of spermatozoa is indicated by Miescher's observation that the amount of lecithin in the blood is increased during the period of formation of the reproductive cells.

The fat content of the human blood is abut 2 per cent. It is present either combined with phosphorus as the group of esthers known as the lecithins, or with waxy alcohols in the form of cholesterols. The concentration of these substances, both of which are constituents of the semen and the brain and nerves, often vary, depending on intake and outgo; thus the eating of egg yolk can increase the concentration of both. Activity of the sex glands causes withdrawal of both. This means a lessened supply available to the nervous system. Neurasthenia may be the result of such lecithin and cholesterol withdrawals, which, if excessive can lead to actual psychoses.

One of the earliest discoveries about the chemistry of the brain is its high content of phosphorus, which is either combined with proteins and sugar as nucleo-proteins, with proteins alone as phosphoproteins, or with lipoids as phospholipins, to which group lecithin belongs. On the basis of such observations arose the saying of Moleschotte and Liebig, "There can be no thinking without phosphorus." Thus started the tradition that phosphorus and foods rich in it are good for one leading a brainly life. Dr.Louis Berman, biochemist, suggests that the properties of characteristic of the brain are connected with the presence of phospholipins (oxygen-poor fats combined with phosphoric acid) within it. "That they increase in amount proportionate to the degree of complexity of the nervous system as it gets older and more learned also supports the

view of their importance," he observes, so answering himself a question he elsewhere brings up in another part of his book, "Food and Character": "No one has yet isolated the various substances which make for the best metabolism of the nerve cells, and their quickest recovery from fatigue. When these substances will be in our hands, the chemistry of the superman will be in view. The artificial creation of mentally superior human beings will then become the definitely achievable ultimate goal of chemistry." These substances for the best nutrition of nerve and brain tissue are without doubt the phospholipins, including lecithin. They are present in the semen and internally fed to the body when the seminal fluid is conserved and resorbed, rather than wasted. It then becomes a true internal nerve and brain food.

The gray matter of the brain contains 17% lecithin, which is the essential and indispensable medium through which the higher intellectual processes manifest themselves. The greater the purity in which lecithin is found, the higher the intelligence of the animal, even in insects. The superior acuteness displayed, for instance, by bees and ants, is due to this fact. The quality of these highly organized phosphorus compounds (i.e., lecithin) appears to be vitally connected with the intellectual capacity of the brain. In idiocy and insanity there is a qualitative and quantitative diminution of brain lecithin.

That insanity might be due to a deficiency of lecithin in the brain, resulting from a deficiency in the blood, is indicated by the observations of Lassaigne, who found a decreased quantity of lecithin in the white brain matter of the insane. Commenting on this subject, Fischer, a French biochemist, states: "The content of the brain in combined lipoids seems, then, to have some relation to intellectual power and to its modifications as well." Similarly, insanity due to alcohol has been shown to be due to the same cause, since alcohol is a lipoid solvent. It has been shown by experiment that in the series of agents which act as narcotics, the anesthetic power increases in proportion to the quantity of lipoids that the liquids employed are capable of dissolving from the brain. Chloroform and ether both possess the property of dissolving lipoids, as was shown in 1905 by Overton, the discoverer of the lipoids. It has also been shown that after anesthesia, ether and chloroform accumulate in the nervous tissues. The experiments of Niclous and Frison have proven that the white matter of the brain, which contains twice as much lipoids as the gray, can fix twice as much chloroform. May not the deep unconsciousness that follows sexual activity be due to withdrawals of lipoids from the brain by the sexual orgasm, producing results similar to those that follow the administration of an anesthetic, which likewise withdraws lipoids from this organ?

Since both the brain and the sex organs extract identical substances from the blood (lecithin, cholesterol, etc.), this would mean that there exists a chemical antagonism between them since increased activity of the latter means decreased nutrition of the former. The more lipoids that the sex glands withdraw from the blood, the less is available to the brain. This is confirmed by the observation of Darwin that the brain of rabbits diminishes in size under domestication. It is well known that domesticated animals have more frequent estrual periods and reproductive activity than wild ones. The diminished size of the brain in the domesticated species is associated with greater sexual activity and resulting withdrawal of brain lipoids.

These considerations indicate that all loss of seminal lipoids, whether through coitus, masturbation or nocturnal emissions, are at the expense of the brain: and this effect is most

detrimental during childhood and before maturity, when the brain is in the process of growth. Chakraberty, discussing the adverse effect of seminal losses upon the brain, writes: "The loss of concentration of lecithin and phosphates becomes a serious drain on the nervous system. Lecithin and phosphates are the principal components in the structure of the brain."

Continence results in a greater supply of lecithin, cholester(?) and phosphates in the blood, and consequently in the brain. Brown-Sequard has shown that testicular secretions increase nerve and brain vitality. Chakraberty remarks that the eating of desiccated testicles has a stimulating effect on the central nervous system "due to the nucleo-albumins, lecithin and phosphorus in which they are so rich, and which are also prominent constituents of nervous tissues." (However, there is no need to eat desiccated testicles when each individual can conserve and resorb the valuable secretions of his own). According to Fischer, the sex glands may be considered as reservoirs of lipoids, which they release into the blood to energize the brain. And conversely, through external emission, they can withdraw lipoids from the blood, and thus indirectly from the brain.

No adequate comprehension of the sexual question can be had without understanding the chemical composition of the semen and spermatozoa. When it is realized that they contain in high concentration phospholipins essential to the nutrition and normal functioning of the central nervous system, it will be realized that withdrawal of these substances from the body by seminal emissions must have an adverse effect on the nutrition of the brain and nerves, predisposing to neurasthenia and other nervous and mental affections. Here we have the biochemical basis for a new neurology and psychiatry.

**CHEMISTRY OF THE SEMEN**

Seminal fluid is composed of the secretory products of the testis, epididymis, seminal vesicles, prostate gland and Cowper's gland. It is a viscid, albuminous fluid, alkaline in reaction and opalescent in color. The average amount given off at each ejaculation, which varies with individuals and with the same individual at different times, is about 5 grams. In each ejaculation about 226 million spermatozoa are believed to exist.

Human semen contains 90 per cent water and 10 per cent solids which when incinerated yield 1 per cent ash. The quantitative analysis of the ash reveals a large amount of calcium and phosphorus. According to Lode, the amount of calcium given off at one ejaculation is about 0.01 gm., which exceeds that in an equal quantity of lime water. As we have mentioned, the semen also contains a substance named spermine, which is a powerful metabolic stimulant and has been so recommended by Poehl in 1898. Spermine has also been found to be present in the gray matter of the brain. This may explain its nerve-invigorating properties, which resemble those of lecithin, also present both in the semen and the brain.

The physiological chemist, Simon, describes the semen, as a thick, whitish, glutious mass containing cholesterin, which he calls "brain fats", and lecithin, a phosphorus-containing fatty constituent of brain substances. If the semen is allowed to stand until it evaporates, Simon notes that it deposits a film of prisms composed largely of phosphate of lime. On heating it gives off ammonia, leaving a carbonaceous mass containing sodium chloride, calcium phosphate and

magnesia. According to Lode, the ash of the semen contains 20% calcium and 30% phosphoric acid.

Chakraberty describes the composition of the semen as follows: "The protein substance consists of nucleoproteins, traces of mucin, albumin and a proteose, and is relatively richer in nuclein than any other part of the body. The mineral bodies are calcium, phosphorus, sodium chloride and potassium." It is thus clear that emissions of semen can withdraw considerable minerals from the body, and so predispose to mineral deficiency, in addition to the withdrawal of lecithin, cholesterin and nucleoproteins.

It is to its prostatic components that the semen owes its milky turbidness and peculiar odor. This milky turbidness is due to the lecithin globules (fatty-nitrogen-phosphorus compounds) of the prostate gland, the decomposition of which leads to the odor. The prostatic secretion also contains sodium, potassium, calcium, magnesium, chlorides, phosphorus, sulfur, nucleoproteins, albumin, etc. In a paper, "The Constitution of the Normal Prostatic Secretion" (Am. Jour. Med. Sciences, Aug., 1903), Stern points out the presence in the prostatic secretion of "abundant amounts" of phosphorus-containing lecithin, an essential constituent of nervous tissue. The loss of this deprives the nerve cells of nourishment; and this explains the relation between prostatitis and neurasthenia. No two organs show greater similarity in their lecithin, cholesterin and phosphorus contents as the semen and the brain. The analyses of Slowtzoff, Meischer and Lode show the semen to contain:

PROTEINS (Albumin, nucleoproteins, globulins, 2.65%mucin, nuclein, proteose, protamin, hemialalbumose, alkali albuminate)

LIPOIDS (phosphorized fats, including 0.412% lecithin)

CHOLESTERIN 0.208%

MINERALS (phosphorus, sodium, potassium, 0.910% calcium, magnesium, iron, sulfur, chlorine)

The high concentration of lipoids (lecithin, etc.) in the semen, rivaled only by that in the brain, is striking. Wheelon(?) writes: "The beneficial results following the administration of testicular preparations have been considered due to the presence of nucleo-albumin rich in phosphorus, resembling lecithin or glycerophosphates (Sajous). Microscopic studies have definitely shown the presence of fatty particles in the interstitial cells and lymphatics of the testis, the fat content varying with the sexual cycles. Certain investigators, especially Duesberg, contend that these microscopic bodies represent the internal secretion of the testes." The interstitial cells of the testis, like the brain cells, are characterized by richness in lipoids.

## CHEMISTRY OF SPERMATOZOA

No investigator has more carefully studied the chemistry of any cell than Miescher in his studies of the spermatozoon. He found its tail to be very rich in phosphorized fats (phospholipins), particularly lecithin, and also cholesterin, while the head consists almost entirely of

nucleoproteins and an organic substance containing iron, besides abundant amounts of phosphorized fats. According to Miescher, the tail of the spermatazoon has the following composition:

Protein 41.90% Phosphorized fats (lecithin) 31.83% Cholesterin 26.27%

The spermatazoon as a whole contains:

Protein 83.76% Lecithin 7.47% Other fats 4.53% Cholesterin 2.53% Chakraberty describes the tail of the spermatazoon as being composed of proteins, lecithin, cholesterin and lipoids, and states that "its composition resembles the non-medulated nerves or the axis-cylinder."

According to Meischer, the head of the human spermatazoon consists entirely (96%) of a substance very rich in nitrogen and protein, belonging to the group of compounds known as nucleo- proteins. The other four percent of the substance of the head of the spermatazoon consists of lecithin, cholesterin, fat, calcium phosphate, calcium carbonate and an organic substance containing 0.12% iron.

Miescher found a higher concentration of lecithin in the blood of fish at the time of spermatogenesis than normally, which indicates that a considerable amount of lecithin is withdrawn from the circulation for the formation of spermatozoa. He also observed that in the salmon, the sexual organs develop at the expense of the muscular system and that the proteins deposited in the testes for the formation of spermatozoa is derived from the protein of the muscles, since the fish does not take in any food during this period. He noted that during the breeding season the muscles of the salmon atrophied to the degree that the sex glands became more active. Marshall remarks on this subject, "In the salmon, the material for the growth of the testis is supplied by the muscles undergoing atrophy."

In the human subject a similar relation has been noted. It should be observed that the adrenal glands and the testes are embryologically and histologically closely related. The excessive withdrawal of lipoids from the blood by the sex glands is at the expense of the adrenal cortex, just as the withdrawal of protein observed by Miescher is at the expense of the muscles. Excessive gonadal activity, by depriving the adrenal cortex of lipoids, leads to its atrophy. Thus, in cases of dementia praecox, many of whom were habitual masturbators, there was noted by Mott atrophy of the adrenal cortex together with progressive atrophy of the testicles. It has also been noted that excessive withdrawal of nucleoproteins and other substances from the blood to form spermatozoa may cause diminution in the size of the thymus gland and its atrophy, which probably is the reason why this occurs after puberty. (Could the atrophy of the pineal gland, accompanying that of the thymus, not be due to a similar cause, in view of the richness of the pineal in lecithin?) Prof. Sajous shows that thymic tissue and lymphocytes are remarkably rich in nucleins, as are the heads of the spermatozoa.

Backmann found that the thymus attains its greatest size and weight just when the spermatogenesis commences, after which it starts to atrophy. Hammar noted that the thymus increases in weight from birth to puberty, but as soon as the first seminal emissions occur, with the onset of puberty, it commences to retrogress and lose weight. These facts indicate that the

sexual changes of puberty, instead of being the effect of thymus atrophy at this time, are the cause.

Ostwald states that the spermatozoon contains an oxidizing ferment which acts on the ovum during fertilization and initiates its development. Loeb considers this oxidizing ferment to be lysine, whose action on the cell wall of the ovum starts embryonic growth, which can occur without fusion of cell nuclei.

The proteins of the brain cell and those of the head of the spermatozoon are very similar. Both contain abundant amounts of nucleic acid, and the head of the spermatozoa, like the Nissl substance of the brain cell, is very rich in nucleoproteins. Both the spermatozoon and the cortical brain cell are remarkably similar in their general formation. It is significant that the spermatozoon contains more phosphorus than any other cell of the body except the brain cells; and since with each ejaculation 226 million spermatozoa are given off, it is clear that in this way a considerable amount of phosphorus is lost, in addition to the phosphatic constituents of the semen.

## CHEMISTRY OF THE BRAIN

Modern knowledge of brain is comparatively recent and goes back to 1910 when Thudischem published "Die Chemische Konstitution des Gehirns des Menschen und de Thiere" (Chemical Composition of Human and Animal Brains). It was early realized that the most striking difference between the chemistry of the brain and that of the rest of the body is the large quantities of lipoids it contains, especially lecithin. Nerve and brain tissue are fatty substances; approximately half of this fat is cholesterin and approximately half consists of lipoids, half of which is lecithin.

No tissues in the body contain such a large quantity of fatty, alcohol-soluble substances (i.e., lipoids) as the brain, with the exception of fat tissue itself. The lipoids of the brain, however, are almost entirely free from neutral fat. These lipoids contain large amounts of phosphorus. These phospholipins have a very important function in the brain and increase in quantity with its development. The most important of them is lecithin. The growth of the brain in infancy has been found to be proportional to the lecithin content of the milk. Human milk, intended to nourish a more rapidly growing brain, therefore contains more lecithin than animal milk.

Brain lipoids are of two kinds. Some, like lecithin, are found in other organs, while others, like cephalin, phrenosin and keratin, are found only in the brain. The white matter of the brain contains twice as much cholesterin as the gray matter; the latter, on the other hand, contains twice as much lecithin and three times as much cephalin. This explains the reasons for Lassaigne's observation that in insane subjects the amount of fat and lecithin in the brain decreases in enormous proportions.

Students of the physiological chemistry of the central nervous system emphasize the fact that in the active protoplasm of each nerve and brain cell, lecithin and cholesterin are the most prominent constituents. They are also the principal constituents of the semen, which, like the brain, is also a fatty substance. These facts clearly indicate the existence of an important

biochemical relationship (through the medium of the blood) between the semen and the central nervous system: Lecithin, according to Sajous, is "a conspicuous component of the brain, nerves, yolk of egg, semen, pus, white blood corpuscles and the electrical organs of the ray." Concerning the importance of lecithin to the nerve cells, he says: "Lecithin, therefore, becomes the functional ground-substance of the cell- body of the neuron, just as it is in the nerve. Both in the neuron and its continuation, the nerve, therefore, the vascular fibrils carry blood-plasma, which, by passing through their walls, maintains a continuous reaction, of which the phosphorus of the lecithin and the oxygen of the blood-plasma are main reagents, and chemical energy is the end-result." According to Duval's observations, functioning nerve tissue is the seat of intense combustion accompanied by the liberation of heat; in view of Evan's deductions, this should consist chiefly in the oxidation therein of organic phosphorus compounds (i.e., lecithin).

Concerning the large amounts of phosphorus in the brain, Professor Mathews, the physiological chemist, says, "Not only do we find compounds of phosphorus in the protoplasm of the brain (and its importance was emphasized by Thudischem by the selection of the phosphatide, to indicate that the other radicals are grouped around it), but phosphorus occurs in large amounts in the nucleus and in phytin; it helps regulate cell reactions." Among the phosphatides (phospholipins) that compose the largest part of the solids of the brain are: lecithin, cephalin, myelin, sphingomelin, amino-myelin and paramyelin. Besides the phospholipins are the glycolipins, which include phrenosin, kerasin, cerebron, homcerebrin, and cerebric acid. There are also amino-lipins, or nitrogenous fats. The medullary sheaths surrounding the nerves are composed of glycolipins (cerebrosides), phospholipins and cholesterin. Sajous states his conviction that the myelin of the nerves is not a mere insulating material or sheath, but a phosphorus-containing substance (lecithin) which, when in contact with oxygen-laden blood, generates nerve-electricity through oxidation. The importance of sufficient lecithin to keep the myelin sheaths properly nourished is therefore apparent. Could not the symptoms of neurasthenia, i.e., diminished generation of nerve-electricity, be due to lecithin deficiency as the result of seminal withdrawals? Lipins, including lecithin, play a role in maintaining of irritability of the nerves. Mathews believes, with Sajous, that the lecithin and lipins of the myelin sheaths have a nutritive function in relation to the nerves. Tashiro showed that nerve fibers are centers of the most active metabolism of any cells of the body, and that they are nourished by the lipoidal substances of the sheath that surrounds them, namely, the phosphatides. It is therefore clear that phosphatides, most important of which is lecithin, are of great importance to the nutrition of the nerves, and that an abundant supply of them in the blood makes for the best nutrition of nervous tissue, while a deficiency, as is caused by excessive activity of the sex glands, leads to under-nutrition and diminished functioning of nerve and brain cells, which can lead to the appearance of neuroses and psychoses.

According to Mathews, the materials of which the medullary sheath of the nerves is composed are galactose, inosite, fatty acids, phosphoric acid, sulphuric acid, potassium, calcium and sodium besides abundant lecithin. Mathews states that in order to fulfill its nutritive function in relation to nerve cells, the myelin sheath contains a reserve of phospholipins (lecithin). The more rapid the metabolism of the nerve fiber, the larger the quantity of such nutritive substances that pass from the myelin sheath to the rest of the nerve cell.

In view of these considerations, neurasthenia should be viewed as a condition of lipoidal undernutrition of nervous tissue due to a lack of lecithin and phosphatides in the medullar sheaths. Sexual neurasthenia is obviously due to the withdrawal of these substances from the blood by the sex glands and their discharge through the semen.

According to Petrowssky, the gray and white matter of the brain have the following composition:

Parts per 100 Gray Matter White Matter

Water 81.62 68.25 Fixed residuum 18.28 31.75 Albumen and keratin 11.42 8.87 Lecithin 3.16 3.14 Cholesterin and fats 3.44 16.64 Cerebrin 0.10 3.01 Minerals (potassium, sodium, calcium, magnesium, iron, phosphorus, chlorine, sulfur) 0.26 0.18

The albumens found in the brain are similar to those in the semen. Both are composed chiefly of albumen and lipoids; and both contain more cholesterol, lecithin and phosphorus than other parts of the body. The brain also contains cephalin, cerebrosides, cerebric acid, myelin, neuroplastin and lactic acid.

It is interesting to note that the cerebro-spinal fluid, like the semen, is rich in calcium, phosphorus, sodium, magnesium and chlorine, and has an alkaline reaction. The ancients note a relation between the semen and the spinal cord, and Hippocrates believed that involuntary seminal losses can cause tabes dorsalis. That they cause spinal weakness is well known.

That the sex glands and the brain have an intimate physiological connection with each other, which is antagonistic in the sense that greater activity of one leads to decreased activity of the other, has been stated by Havelock Ellis in the following words:

"The brain and the sexual organs are the great rivals in using up bodily energy, and there is an antagonism between brain vigor and extreme sexual vigor, even though they may sometimes appear at different periods in the same individual. In this sense, there is no paradox in the saying of Roman Correa that potency is impotency and impotency potency, for a high degree of energy, whether in athletics or in intellect, is unfavorable to the display of energy in other directions.... The masters of all the more intensely emotional arts have frequently cultivated a high degree of chastity. This is notably the case as regards music. One thinks of Mozart, of Beethoven, of Shubert. At the age of twenty-five, when he had already produced much fine work, Mozart wrote in a letter that he had never touched a woman."

Dr. Ryan expressed a similar thought when he wrote:

"Bacon observed that no one of great genius in antiquity had been addicts to women; and he stated that among the moderns the illustrious Newton had never enjoyed sexual intercourse. This fact confirms the remark made by Aretaeus, and since verified by physiologists, that continence, or the reabsorption of the semen into the bodily economy, impresses the whole organism with an extreme tension and vigor, exciting the brain and exalting the faculty of thought."

**NEURASTHENIA AS A LECITHIN DEFICIENCY DISEASE**

That neurasthenia is the result of lecithin starvation of nerve cells, due to sexual withdrawals of lecithin, is indicated by Dr. Bernard Talmey, eminent American sexologist, in a paper entitled, "Sexual Problems of Today, with a Case of Hysterical Insanity Caused by Excessive Masturbation," in which he writes:

"The percentage of neurasthenia of sexual origin is so large that it is always well in the presence of this anomaly to look for sex as a fruitful cause. There is an intimate relation between the genitals and the head... The two perversions, masturbation and onanism (congressus interruptus of Onan) are oftener the cause of the general breakdown than excesses in normal sex life. Of these two, masturbation is the more dangerous because its practice usually begins in the immature child, and if indulged in to excess, leads to fatigue and exhaustion of the central nervous system."

On the same subject, writing on the causes of nervous debility, Dr. Frederick Humphrey says that it "is almost invariably the result of some drain upon the vital forces, such as excesses of various kinds: excessive morbid indulgence, involuntary losses of vital fluids, too long and too constant excitement of the sexual system, and more especially when such indulgences are allowed in connection with mental and physical overwork. Nervous debility is often brought on in young persons by the habit of masturbation, which, if persisted in from time to time, is inevitably followed by consequences immediate and remote, and are of the most formidable character. It is safe to say that multitudes are every year brought into the most deplorable condition of nervous debility from these very pernicious practices alone."

Dr. El Lernanto writes: "In the male sex, nerve-exhaustion manifests itself by spermatorrhea or involuntary loss of semen, due to sexual gratification and other gratifications of the passion in and out of the martial relation, both in adults and youths."

In an article, "Sexual Neurasthenia and the Prostate" (Medical Record, Feb., 1912), Prof. F. G. Lydston presents evidence to prove that neurasthenia has its roots in prostatic dysfunction caused by sexual indulgence, which results in depletion and derangement of the prostatic hormone. He writes:

"There is almost always some functional derangement of the sexual apparatus behind which lies a varying degree of organic disorder (in neurasthenia). My experience leads me to the conclusion that neurasthenia in the males is associated with prostatic hyperemia and hyperesthesis of the prostatic urethra more than with any other condition.... Practically all of these subjects have been masturbators, many of them have indulged in sexual excesses, and not a few have had gonorrhea.... I doubt if it is possible for one to indulge in either masturbation or sexual excess for any length of time without producing disturbance of prostatic circulation and innervation... Practically every masturbator who has practiced the habit for any length of time may be considered as having a more or less tender and swollen prostate. My experience goes to show that this condition underlies many of the cases of nocturnal emissions with which we meet."

Professor Casper considers masturbation and excessive coitus as the true causes of neurasthenia, writing, "In general it may be stated that masturbation is more prone to produce cerebral neurasthenia, while excessive sexual intercourse tends rather to cause the spinal form."

Dr. Allen, in a paper, "Etiology and Pathology of Impotence," considers masturbation and sexual excess as the causes of impotence, producing as they do inflammation and congestion of the prostatic urethra, a condition predisposing to nocturnal emissions and spermatorrhea, which precipitate loss of functional activity of the testicles, which is the essential feature of impotence. According to Prof. Lydston, nocturnal emissions always denote a condition of inflammation and congestion of the prostatic urethra, which can pass into a more serious form, if not cured, as diurnal emissions and spermatorrhea, the underlying causes of which are masturbation and sexual excess.

**THE PROSTATE SECRETION AND NEURASTHENIA**

Physiologists in the past knew little concerning the function of the prostate gland. Steinach found that its secretion facilitates fertilization, since spermatozoa are impotent without it. As time went on, the idea that this gland is a true endocrine headway; and in addition to prolonging the life of the spermatozoa, observers were agreed that "the secretion of the accessory glands (including the prostate) may perform other important functions."

That resorbed prostatic secretions have a nutritive effect on the spinal cord is indicated by the experiments of Engles who found that the injection of an extract of the lumbar cord of a buck resulted in the cure of impotence and catarrh of the prostate. Chemically and physiologically, there appears to be a close relationship between the spinal cord and prostate glands. The removal of the prostate through prostatectomy, which leaves the patient physically, nervously and mentally incapacitated, has also shown that this gland has an important hitherto unsuspected physiological function. Such observations have led Macht to ask, "Can such an impairment in mental efficiency be attributed to the extirpation of the prostate gland and the consequent deprivation of an internal secretion elaborated by it?"

Macht attempted to answer this question by experiment. He found that when young rats are prostatectomized they show a distinct weakness of the hind legs and are slower to learn that non-prostatectomized animals. That this was not due to the operative technique itself but to the fact that when the prostate is removed there is an absence of its specific internal secretion, is indicated by the fact that when the testes were removed there was no such muscular incoordination and weakness as followed the removement of the prostate. The prostatectomized rats improved when fed on gland substance. These observations indicate that the prostate gland produces a hormone essential for the well-being of the spinal cord and that deprivation of this hormone injures the cord and results in disturbed functioning.

In an article, "The Prostate Gland as an Endocrine Organ," Macht writes:

"The experiments on the tadpoles, revealing a distinct influence of prostate feeding on the growth and development of the animals, and the data so far in hand concerning prostate feeding in higher animals, speak very strongly in favor of an endocrine function of the prostate gland. These experiments, together with those of Serralach and Pares, would seem in the author's opinion, to be the chief evidences in favor of such a function... Feeding with prostatic substance exerts an influence upon the growth and differentiation of tadpoles. This, of course, would speak in favor of an internal secretion of the prostate gland." Macht and Bloom noted an atrophy of the

testes in rats when the prostate was removed. According to Hunt the prostate functions in connection with the testis in the production of sex hormones.

In an article, "New Theory of the Function of the Prostate" (Endocrinology, Nov. 1925), Dr. Hunt presents evidence to prove that the testicles are not alone responsible for the production of sex hormones. He cites a case of diminished sex function in a man with a hypertrophied prostate, removal of the prostate leading to complete cessation of sex function. A ram's testicle was then successfully transplanted. Though this resulted in an increase in nervous vitality, no sexual change occurred. However when a bull's prostate was implanted, sex desire and function were re-established. Such observations led Dr. Hunt to conclude that "the prostate is definitely responsible, with the testicle, both for sex function and sex desire.... Hypertrophy of the prostate occurs too often with the onset of impotence or diminished function to be attributed to mere coincidence."

Hunt's view is further supported by Dr. W. Belfield of Chicago who claims to have clinical evidence to prove that the testes and ovaries are not the sole seats of sex hormone production, and that other glands take part in their formation. He has come across cases in which there was complete development of sexual traits though the sex glands were absent, nor were there signs of castration. In other cases the individual was sexually normal though he possessed glands of the opposite sex. Belfield therefore concludes that there is "a force independent of the gonads which enters into the determination of the sex features." Blair Bell holds a similar view, based on the study of the sex glands of hermaphrodites. He claims that all of the endocrine glands, and not exclusively the sex glands, enter into the determination of sexual traits.

It appears that the internal secretion of the prostate gland accelerates growth and metamorphosis by its stimulating influence on the thyroid and pituitary gland, which Macht believes is the reason for the increased growth of tadpoles when fed on prostate substance. Indicating the importance of the prostatic secretion (which is present in the semen) to the nervous system, Prof.Lipschutz writes: "It is said that prostatectomy involves an even [more] severe operative interference than castration, especially in young individuals."

Clear evidence of the importance of the prostate secretion to the body is afforded by the study of its loss as occurs in cases of spermatorrhea, a disease characterized by the involuntary emission of prostatic and other seminal secretions unaccompanied by any erotic sensation -- a condition closely allied to prostatitis. The loss of lecithin, cholesterin, phosphates, etc. thus occasioned exercises its most immediate and profound effect on the spinal cord and entire central nervous system. Spermatorrhea (literally "a flow of semen") was known to Hippocrates, who called the disease tabes dorsalis. He writes:

"Tabes dorsalis proceeds from the spinal cord. It is frequently met with among newly married people and libertines. There is no fever, the appetite is preserved, but the body falls away. If you interrogate the patients, they will tell you that they feel as if ants were crawling down the spine. In making water or going to stool, they pass much semen. If they have connection, the congress is fruitless. They lose semen in bed, whether they are troubled with lascivious dreams or not; they lose it on horseback or in walking. To epitomize: they find their breathing becomes difficult, they fall into a state of feebleness, and suffer from weight in the head and ringing in the

ears. If in this condition they become affected with a strong fever, they die with cold extremities." For the cure of this condition, Hippocrates advised sex abstinence and avoidance of alcohol. Celsus advised in addition an avoidance of alcohol. Celsus advised in addition a special raw vegetable diet. Aretaeus advised continence and cold baths. Languius advises intestinal purification through proper diet as the basic factor in the cure of this condition.

Celsus believed that consumption may be caused by involuntary seminal losses. Satorius thought that spermatorrhea predisposes to calculus and loss of sight. Saint Marie, who was the first to emphasize the fact that the discharges of spermatorrhea consist of mucous secretions from the urethra and prostate gland, rather than of testicular fluid, observed that such discharges lead to affections of the spinal marrow. He writes:

"I have discovered that a great many cases of hypochondria, of slow nervous fevers, or consumption, were kept up by this kind of gonorrhea."

Wichman, in 1772, noticed that spermatorrhea was followed by consumption and hypochondria. He believed that masturbation and excessive sexual intercourse were the predisposing, and that constipation (leading to compression of the seminal vesicles while straining at stool), was an exciting cause. He writes: "All the patients observed by me were from twenty-five to forty years old. All were addicted to the pleasures of love, or to onanism.... When you see a man extremely thin, pale, stupid, enervated, complaining of great debility, especially in the thighs and loins, lazy in his actions, and with sunken eyes, you have reason suspect this cause."

Swediaur observed that involuntary discharge of prostatic secretion were followed by general debility, emaciation and even death. Cullerier attributed these losses to the irritation produced by hardened feces in the colon. The authority, Acton wrote:

"I am convinced that many of the most obstinate complaints which the medical man meets with arise from the loss of semen. The condition of ailment which we have characterized as spermatorrhea, then, as we shall use the word, is a state of enervation produced, at least permanently, by the loss of semen."

Our modern knowledge of spermatorrhea dates back to Lallemand, who made the most careful study of this disease. He traces it to an inflammation, congestion and hypersecretion of the mucous membranes of the urethra, primarily initiated by frequent sexual orgasms and intensified by the irritation of toxic blood resulting from wrong diet and autointoxication. Alcohol, coffee, tea and spices, by irritating the genital mucous membranes, he believes to contribute to this condition. The chief causes, he says, are "sexual excess and masturbation, which act principally by provoking inflammation or irritation of the ducts, and prolonged erections excited by erotic ideas or lascivious publications."

Professor Batholow of the Medical College of Ohio, in his book on spermatorrhea, considers masturbation and sexual excess as the chief causes. He then goes on to show that the frequently repeated sexual orgasm causes a condition of inflammation of the urethra, manifesting first as nocturnal emissions, and when more serious merging imperceptibly into true spermatorrhea, in which the act of emission occurs without erection, pleasure or particular sensation, the semen

gradually losing its color, odor and spermatozoa gradually coming to resemble mucous or prostatic secretion, often being lost with the urine. Professor Bartholow believes that spermatorrhea may cause degeneration of the cells of the gray matter of the spinal cord, which indicates a relationship to tabes dorsalis or locomotor ataxia, which has been repeatedly observed by physicians in both ancient and modern times. This is understandable in view of the close similarity in chemical composition between the semen and the spinal cord, for which reason excessive losses of semen can deprive the myelin of spinal tissue of lecithin, which is so necessary for the nutrition of nerve cells. Deslandes, Tissot and others have described various spinal affections, including paralysis and poliomyelitis, caused by masturbation. On this subject, Prof.F.G. Lydston, professor of diseases of the genito-urinary organs at the Medical School of the University of Illinois, writes:

"As might be inferred from the fact that sexual excess and masturbation bear an important relation to locomotor ataxia, spermatorrhea is associated with that form of nervous disease more often than any other. The evil habit of masturbation, if continued, produces great irritation of the procreative organs -- especially of the seat of sexual sensibility in the prostatic urethra... Erotic dreams result, with losses of seminal secretion. This may merge into true spermatorrhea, the morbid condition finally becoming so pronounced that with little or no provocation, losses occur in the daytime.

"Spermatorrhea, in the majority of instances is the result of sexual excess or masturbation, and, moreover, the effects of the venereal organs being expended upon the nervous system, it is rational to infer that the disease when fully developed essentially is a neurosis."

Dr. Howe, professor of clinical surgery at Bellevue Hospital Medical School, believes that sclerosis of nerve fibers of the cerebellum may be caused by involuntary emissions of semen by night or day. He also thinks that "diseases of the brain and cord are ushered in and accompanied by frequent ejaculations of seminal fluid. Many of the cases are accompanied by impotence, others develop satyriasis and priapism. He adds:

"In one case of partial cerebral sclerosis which involved a small portion of the cerebellum, the patient suffered from frequent emissions before any symptoms of cerebral trouble manifested themselves. Coincident with manifestations of the sclerosis, the pollutions were increased in frequency, and as the disease progressed, were of daily and nightly occurrence.

"Progressive locomotor ataxia was at one time supposed to arise from inordinate sexual congress and onanism.... A majority of patients suffering from locomotor ataxia have spermatorrhea of troublesome nature. In the later stages of the disease there is complete loss of virile power. In the cases which are preceded by spermatorrhea, the disease is of a more serious nature, and is more apt to run a rapid course and reach a fatal termination.

"Other diseases of the spinal cord, such as white softening, tumors and injuries, are all accompanied by some disarrangement of the genital functions. In some instances, they are characterized by frequent ejaculations and loss of virility; in others priapism and aspermitism are present. In injuries which produce a certain amount of irritation and inflammation, the latter conditions are more likely to be present, while in anemic conditions, or chronic softening,

seminal emissions and impotence are usual. Chronic or white softening of the spinal cord may arise as a result of masturbation and sexual excess."

Dr. Guy, in his "Diseases of the Urinary and Generative Systems," says that spermatorrhea is associated with pains in the back and with wasting away of the spinal marrow. Dr. Milton, in his "Spermatorrhea", speaking of the effects of this disease, says: "The more serious results are amaurotic(?) and epileptiform symptoms, epilepsy, phthisis, insanity, paralysis and death." Holmes, in his "System of Surgery," mentions a relationship between spermatorrhea and epileptiform symptoms. Dr. Russell wrote an article in the "Provincial Medical and Surgical Journal" on "The Connection Between Spermatorrhea and Epilepsy." Dr.Watson, writing on the relation between spermatorrhea and nervous and mental diseases, writes:

"I have not observed such results myself, with the exception of sanity, of which I have seen several instances; but, there seems no doubt about the facts themselves. Epilepsy seems clearly to have ensued in several cases of excessive masturbation. McDougall saw three instances of this; and Sir Thomas Watson speaks of it as a very frequent result.

"Dr. Durkee mentions epileptiform convulsions and idiocy as results of masturbation; and Dr. Lisle, medical inspector of one of the French lunatic asylums, states that spermatorrhea is a frequent cause of insanity, that this form of derangement is easily recognized, and that all treatment, directed solely against the brain is powerless here; whereas the affection is instantly and rapidly cured if the discharges be arrested, unless indeed the case has gone on to paralysis and dementia."

Formerly spermatorrhea and gonorrhea were identified as the same disease, and also gonorrhea and syphilis. Spermatorrhea appears to represent a catarrhal inflammation of the genital mucous membranes, accomplished by a mucous discharge. Ordinary nocturnal emissions constitute a primary manifestation of such a catarrhal inflammation, while true spermatorrhea represents a more advanced form, being the male homologue of leucorrhea in the female. When the inflammation of the genital mucosa advances from a catarrhal to a purulent stage, the discharge assumes a purulent character; and in place of whitish or colorless mucus, there occurs the characteristic yellowish purulent discharges of gonorrhea accompanied by the gonococcus. From the above considerations it is clear that the pathological symptoms of gonorrhea, especially those affecting the nervous system, must have a relation to the adverse effects on nervous tissue of the withdrawal of lecithin and other constituents of the seminal secretion produced by previous sexual orgasms and the urethral inflammation and involuntary discharges they produce. That gonorrhea is not entirely due to germ infection, but represents a more advanced state of inflammation of the genital mucosa than spermatorrhea, is indicated by cases of innocent gonorrhea resulting from sexual intercourse during menstruation by married couples both free from the disease, and as the result of masturbation in young girls. It is clear that the neurological symptoms of gonorrhea, like those of spermatorrhea, are produced, if not exaggerated, to a great extent by the loss of lecithin, through the seminal discharges which invariably precede this disease.

As the inflammation of the genital mucosa advances from a purulent (gonorrheal, state of inflammation to a fibroid and atrophic one, we have the characteristic fibroid growths and

cancers of the uterus in the female, while in the male, the cancer-like growths on the sexual organs characteristic of the beginnings of syphilis appear. That the demineralization and dealkalization of the blood through previous seminal discharges prepare the soil for such cancerous developments, there can be no doubt, while a resulting condition of acid intoxication can prepare the biochemical conditions of the organism for the skin pathologies of secondary syphilis, which bear a resemblance to those that accompany the seminal discharges resulting from the masturbation and involuntary emissions of puberty. As for the more serious symptoms of tertiary syphilis affecting the spinal cord and the brain, it is clear, from the above description of the effects of the lecithin withdrawals of spermatorrhea on these organs, that previous sexual excesses have an important relation to their production, as well as the mercury and arsenic compounds used in the initial stages of the disease, since before they were used in the treatment of syphilis, the specific tertiary form of the disease was comparatively unknown, and did not appear in its present virulency until after these powerful nerve poisons were introduced into medical practice. Prior to this time, syphilis was considered as a more serious form of gonorrhea and both conditions were identified under the name of "venereal disease."

From the foregoing, it is clear that there is an important internal physiological relation between the secretions of the sex glands and the central nervous system, that the loss of these secretions, voluntarily or involuntarily, exercises a detrimental effect on the nutrition and vitality of the nerves and brain, while, on the other hand, the conservation of these secretions has a vitalizing effect on the nervous system, a regenerating effect on the endocrine glands and a rejuvenating effect on the organism as a whole.